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July 5, 2006

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant: Subramania Sudharsanan, et al.
Title: METHOD AND APPARATUS FOR PARALLEL ARITHMETIC OPERATIONS
Application No.: 09/640,901 Filed: August 16, 2000
Examiner: Meonske, Tonia L. Group Art Unit: 2181
Atty. Docket No.: 004-2616 Conf. No.: 3352

Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

- ☒ Reply Brief (37 C.F.R. § 41.41) (10 page(s))
☐ Petition for Extension of Time (month) (page(s))
☐ Information Disclosure Statement (page(s)), including PTO/SB0/8A and/or
PTO/SB/08B (page(s)), and copies of reference(s)
☐ Other: (page(s))
☐ Other: (page(s))
☐ Other: (page(s))
☒ Transmittal Letter (2 page(s));
☐ Return postcard;

The Total Fee has been calculated as shown below:

	Pending Claims	Claims Previously Paid	Extra Claims	Fees
Total Claims	34	- 43 =	0 x \$50.00 =	0.00
Independent Claims	7	- 10 =	0 x \$200.00 =	0.00
Multiple Dependent Claims (if any) - \$360.00 fee				
Additional Claims Fee				\$.00
Fee For Extension Of Time				
Other Fees: ()				
TOTAL FEE DUE:				\$.00

- ☐ Small entity status is entitled to be asserted for the application.
☒ The Total Fee shown above is being paid as directed in an electronic submission of this paper.
☐ A check is enclosed for the Total Fee shown above.
☐ Please charge the Total Fee shown above to Deposit Account 50-0631.
☒ The Commissioner is hereby authorized to charge any deficiency in fees and any additional fees under 37 C.F.R. § 1.16 or 1.17, that may be required during the pendency of this application, and to similarly credit any overpayment, to Deposit Account 50-0631.

July 5, 2006
RE: 09/640,901
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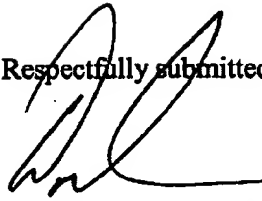
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Respectfully submitted,



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Subramania Sudharsanan, et al.

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REPLY BRIEF (37 C.F.R. § 41.41)

This brief is in response to Examiner's Answer, mailed May 5, 2006, which sets a period for reply ending July 5, 2006. Applicants respectfully request consideration of the following in connection with the present appeal.

REAL PARTY IN INTEREST

The real party in interest in this appeal remains Sun Microsystems, Inc., the assignee of record, as evidenced by the assignment recorded at Reel/Frame 011366/0920.

RELATED APPEALS AND INTERFERENCES

Applicant is unaware of any prior or pending appeal, interference or judicial proceeding, which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1, 2, 4-18, 20-27, 33-40 and 43 are pending. Of those,

- claims 1, 2, 4, 18, 20-22, 27 and 33-40 are rejected;

- claims 5-17 are withdrawn from consideration based on restriction and election;
- claims 23-26 have been indicated allowable if rewritten in independent form; and
- claim 43 is allowed.

Applicant appreciates the allowance and indications of allowability made in Examiner's Answer. Claims 3, 19, 28-32, 41 and 42 have been cancelled.

STATUS OF AMENDMENTS

The "Second after Final Amendment," filed with the Appeal Brief has been entered.

Regarding an "Amendment to Recite Priority Claim," the Office asserts (in the Answer) that USPTO records have been updated to be consistent with the entry of the January 30, 2004 amendment. Since Applicant has complied with the statutory and regulatory requirements for presenting a claim of priority under 35 U.S.C. § 120, 37 C.F.R. § 1.78, Applicant trusts that any patent(s) granting from the subject application will properly recite Applicant's claim of priority. However, for the record, current on-line records (USPTO Private PAIR, Continuity Data) do not correctly reproduce Applicant's claim of priority. For the benefit of this Honorable Board, Applicant emphasizes that the amendment filed January 30, 2004 includes a direct claim of priority to co-pending U.S. Application No. 09/204,480, filed on December 3, 1998, naming as inventors Marc Tremblay and William Joy, now US Patent 6,718,457. Since that claim of priority is central to issues presented on appeal, Applicant again highlights the discrepancy between the recited claim and the apparent content of USPTO records.

SUMMARY OF CLAIMED SUBJECT MATTER

The summary of claimed subject matter contained in the Appeal Brief remains correct.

ARGUMENT IN REPLY

Applicant appreciates the Office's withdrawal (in Examiner's Answer) of its prior rejections of claims 23-26 and 43, together with the related allowance and indications of allowability. Applicant requests withdrawal of the remaining rejections as well.

Regarding Kanakogi

Regarding the rejections still maintained, Applicant does not in any way acquiesce in the Office's analysis of the applied references. In particular, Applicant does not "admi[t] that Kanakogi reads on [sic] claims 1, 2, 4, 18, 20, 21, 27 and 33-40" as suggested by the Office. See Examiner's Answer at 5. Quite to the contrary, the relied upon references are non-anticipatory and do not support a *prima facie* case of obviousness.

For example, with respect to those claims that positively recite at least three source registers specified by the parallel multiply-add instruction or a three, four (or more) operand instruction format, U.S. Patent 6,609,143 to Kanakogi et al. (hereafter *Kanakogi*) discloses a configuration in which an addend is *clearly not sourced* from a register specified by a parallel multiply-add instruction. Rather, register 105 (see *Kanakogi*, FIG. 12 and accompanying description) appears to be an accumulate register internal to the multiply-accumulate functional unit depicted. No instruction-specifiable source register is disclosed. Therefore, at least for claims 2, 27 and 34, *Kanakogi* is non-anticipatory and there is no teaching or suggestion in the art of record for a modification that would introduce into the critical path, significant register access latencies unnecessary (and arguably undesirable) for the multiply-accumulate functional unit disclosed in *Kanakogi*.

Furthermore, regarding claim 1, it is difficult to envision how *Kanakogi's* functional unit could be employed to execute a "single instruction parallel multiply-add function" since no data path is provided for introduction of an addend into *Kanakogi's* computation. Although *Kanakogi's* disclosure is entirely silent, presumably, at least one additional instruction (perhaps with dummy multiplier equal to 1) would need to be executed to preload register 105 with an appropriate addend. A configuration that requires two instructions does not anticipate or render obvious a "method of executing a single instruction parallel multiply-add function." In addition, with respect to claims such as claims 4 and 37, which positively recite attributes of pipeline performance, *Kanakogi's* configuration cannot support the recited cycling. Since register 105 constitutes both a source and a sink for add operations, it cannot simultaneously act as a current addend source (and target) as well as the target of an additional undisclosed (but hypothetical) operation to preload an addend for use in a subsequent pipelined operation. A throughput of one

parallel multiply-add instruction every 2 cycles is simply not compatible with *Kanakogi's* disclosed configuration.

Finally, with respect to claims 20 and 21 (which the Examiner correctly treats as properly depending from claim 18), the Office relies on disclosure in *Kanakogi* which has nothing to do with *either* saturated arithmetic *or* the functional unit illustrated in FIG. 12. Rather, the relied upon disclosure concerns a data extender/shifter 55 employed in the configuration of FIG. 1, which does not correspond to Applicant's claims. The disclosed data extender/shifter appears to be unrelated to saturated arithmetic and no teaching or suggestion exists (in *Kanakogi* or any other art of record) to include data extender/shifter 55 to support saturated arithmetic in the *dissimilar* multiply accumulate functional unit disclosed by *Kanakogi* in FIG. 12.

In short, Applicant has (in an effort to focus issues) previously emphasized the priority claim, which is dispositive in this case. However, Applicant does not in any way acquiesce in the Office's analysis of the applied references. Indeed, for the reasons given above, the Office has failed to support anticipation or make out a *prima facie* case of obviousness for at least claims 1, 2, 4, 20-21, 27, 34, 37 and those dependent therefrom.

We now turn to the priority claim (and sufficiency of support under 35 U.S.C. § 112) which is dispositive for all claims.

Regarding Sufficiency (under 35 U.S.C. § 112) of Disclosure in the Priority Application

As Applicant understands the Office's current position regarding written description support in the priority application¹ for applicant's claims, it is that:

1. Based on the disclosure of Applicant's priority application, "one of ordinary skill in the art at the time the invention would conclude [sic] at least three possible ways to implement pmuladd." See Examiner's Answer at 13, 18, 23-24 at 29 (deducing three variations on the labeling of upper and lower register portions as "first" and "second" components) (formatting added);
2. One of the three deduced variations corresponds to the claims, but the other two (allegedly) do not; and

¹ U.S. Application No. 09/204,480, filed on December 3, 1998, naming as inventors Marc Tremblay and William Joy, now US Patent 6,718,457

3. Because the Office is able to deduce two variations that (allegedly) do not correspond to the claims, the variation (allegedly) claimed is not “necessarily” disclosed by the priority application in accordance with “possession” requirements articulated in *Vas-Cath*² and its progeny.

The Office’s conclusion(s) as to inadequacy of § 112 support constitute(s) clear error and the rejections must be withdrawn for at least the reasons now discussed.

Applicant appreciates the confirmation by the Office that, based on the disclosure of the priority application, one of ordinary skill in the art at the time of the invention would appreciate a range of methods, apparatus and articles of manufacture that include configurations meeting the specific limitations of independent claims 1, 18, 27 and 33. Applicant interprets the Office’s position as (properly) conceding enablement.

Regarding the Office’s written description theory, Applicant respectfully suggests that the variations hypothesized by the Office are not substantive variations at all. Rather they constitute an arbitrary re-labeling of respective components (or portions or values) of operands as a “first” or a “second” component (or portion or value). Hypothecating first, second and third variations in which operand components are alternatively labeled “first and second components” and then “second and first components” is somewhat bizarre, but fails (as a matter of substantive law) as a basis for denying § 112 support for at least two reasons.

First, the disclosure of the priority application unambiguously supports the claims as construed by the Office. *That should, by itself, settle the inquiry.* The Honorable Board is referred to Applicant’s Appeal Brief in which specific support for each claim is detailed. Indeed, the Office even concedes that its first hypothetical implementation directly corresponds to Applicant’s independent claims 1, 18, 27 and 33 (and presumably those dependent therefrom). See Examiner’s Answer at 14, 19, 25 and 30. The vagueness/ambiguity alleged by the Office is hardly of Applicant’s making; rather any “ambiguity” is purely a product of the Office’s own imagination or meanderings. Support under § 112 is complete and, for at least this reason, the Office should reverse the § 102/103 rejections, which are unsustainable in view of Applicant’s priority claim.

² Relevant portions of *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 19 U.S.P.Q.2D (BNA) 1111 (Fed. Cir. 1991) and related Federal Circuit precedent are covered in the Appeal Brief and the Honorable Board is directed

Second, the Office's position that it can deduce (hypothesize) three distinct variations from Applicant's disclosure, and yet bootstrap a denial of § 112 support based on alleged absence of unambiguous identification of particular one of the three deduced (hypothesized) variations which the Office alleges is claimed, is pure sophistry. Labels "first" and "second" are typically understood to be claim language constructs that allow for clarity of antecedent basis when multiple instances of a type component, step or other limitation are recited in a claim set. *No order or precedence is necessarily implied.* Therefore, if Applicant's disclosure, when viewed by a person of ordinary skill in the art, supports each of three (or more) variations and those variations constitute mere interchange of labels, then Applicant's claims (when properly construed) should have scope consistent the three (or more) variations.

In short, the Office cannot have it both ways. If Applicant's disclosure conveys to a person of ordinary skill, the three (or more) variations "deduced" by the Office, then Applicant's claims cover those three variations. Indeed, the Office's theory of "ambiguity" amounts to nothing more than labeling by administrative fiat one component (or portion or value) as the "first" and another one as the "second" and then complaining of an alternative label convention.

Applicant's priority application clearly establishes possession of the subject matter claimed. Therefore, Applicant's claim of priority antedates *Kanakogi* and *Kanakogi* does not constitute *prior* art. Since all rejections are based on *Kanakogi*, they must be reversed.

CONCLUSIONS

For the reasons outlined herein and in the Appellant's Brief, the present rejection of claims 1, 2, 4, 18, 20- 22, 27 and 33-40 should be reversed. Accordingly, Appellant respectfully requests that this Honorable Board do so and direct the present application to be issued forthwith.

thereto for a summary of relevant case law.

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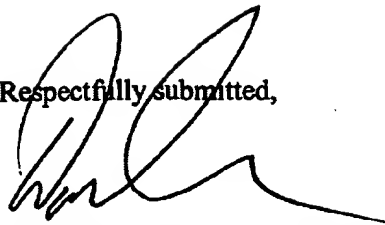
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Respectfully submitted,



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APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

The listing of claims contained in the Appeal Brief remains correct.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. § 1.130, 1.131, or 1.132 or any other evidence entered by the examiner and relied upon by appellant in the appeal.

RELATED APPEALS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified above in the Related Appeals and Interferences section.